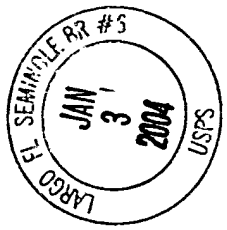

In the Application

Of

Terrance P. Riney

For

System and Method for using a Map-Based computer Navigation System

To Perform Geosearches

Reference

Reference: Non-Provisional Patent number 60/437,975

Field of the Invention

This invention relates to map-based navigation systems. More specifically, it relates to a system and method for using a map-based computer navigation system to perform geosearches.

Background of the invention

Current map-based computer navigation systems based on either Geographical Information System (GIS) technology or Global Positioning System (GPS) technology or a hybrid of both are well known in the prior art. These current map systems rely on a variety of text-based and/or graphic interfaces to present information from the underlying GIS/GPS technology to the end user. One common feature of the existing systems is that they typically present information to a user as static graphic with accompanying text. In other words, they do not allow the user to 'virtually' drive prospective routes. This is desirable because it will enable users to dynamically find an imperfectly remembered

location or verify the suitability of the proposed trip routing. Users' 'drive' will more closely approximate their real life transportation experience this would reduce users' expenditure of time and energy and consequently allows users to get information on more points of interest for a given level of effort. In above-mentioned systems, GPS or GIS no real option is available for specific and detailed information as in 'this east entrance to Interstate is located on north side of road and subsequent west entrance is located on south side', or 'this exit has is divided into east and west'.

A system that dynamically accesses desired information would reduce users' expenditure of time and energy and consequently allows users to get information on more points of interest for a given level of effort. A natural consequence of systems that rely on static information is a lack of additional information on specific businesses that are retrieved without further text input. Such input breaks the normal flow a user would get from a 'drive'. Moreover, a system that minimized keyboard input requirements would help reduce the possibility of repetitive motion injuries such as carpal tunnel syndrome.

In prior map-based navigation systems, the end user typically enters text in an input form's predefined fields to access data from the underlying GIS/GPS technology. An example of this is the driving directions feature found on several Internet sites. A user enters the desired starting and stopping points and the navigation system generates a suggested route including both a map and an accompanying text description. The user can then use various interface buttons to modify the resulting map. For example the user can enlarge (zoom in) or reduce (zoom out) the map scale. However, the resulting map still presents information to the end user as a static graphic with accompanying text.

Numerous variations on map-based computer navigation systems are show in the prior art. Various trip routing systems allow a user to add items/points of interest to trip routing maps. For example, U.S. Patent No. 6,282,489, issued to Bellesfield, et. al. on August 28, 2001, discloses methods, and an apparatus for displaying a travel route and generating a list of places of interest located near the travel route. After a user selects a departure point and a destination point, the routing components employs the routing database to generate and display a route between the selected departure and destination points. If the user requests a list of places near the displayed route, the place selection component employs the places of interest database to generate and display a list of places of interest which are within a predetermined distance of the generated route. U.S. Patent No. 5,948,040, issued to Delorme, et. al. on September 7, 1999, discloses computerized travel reservation information and planning system that, among other features, enables users to pick types of attractions or accommodations within a user-selected region around routes of travel. Similarly, the prior art includes systems that annotate landmarks as navigational aids on a routing map. U.S. Patent no. 6,477,460, issued to Kepler on November 5, 2002, discloses a process and system for the annotation of machine-generated directions with easily recognized landmarks and other relevant information. U.S. Patent No. 6,405,129, issued to Yokota on June 11, 2002, discloses a method of displaying point of interest icons on the display of a navigational system that presents an icon or icons belonging to an icon type which appear on a map in a smaller number from disappearing behind icons belonging to another icon type which appear on the map in a larger number. These systems include point of interest and landmark annotation on routing maps but do not enable a user to find a specific point of interest whose particular

details are not previously known to the user.

Other map-based computer navigation systems allow a user to generate maps of the items or points of interest in a specific area. For example, U.S. Patent No. 6,415,291, issued to Bouse, et al. on July 2, 2002, and U.S. Patent No. 6,408,307, issued to Semple, et al. on June 18, 2002, respectively disclose a system and related methods for remotely accessing a selected group of items of interest from a database. These inventions enable a user to access a common database from a remote communications port to generate a map that locates selected items of interest, e.g., a display of sporting shops in the vicinity of Chicago O'Hara International Airport. U.S. Patent No. 6,240,360, issued to Phelan on May 29, 2001, also discloses a computer system for identifying local resources based superimposing information relating to a place of interest on a geographic map. Similarly, U.S. Patent No. 6,397,143, issued to Peschke on May 28, 2002, discloses a map navigation and display system based on the visual presentation of a shopping center showing the layout of the buildings and stores within the center. Each store is then linked to its own page with details about the business. Higher level maps may also show the layout and location of the shopping centers within a neighborhood or district and within a region. Optional density indicators at the regional level assist users in location areas with a large number of stores. Although these inventions focus on mapping points of interests rather than simply annotating points of interests on a routing map, they still result in static maps with the resulting limitations as discussed above. These inventions do not enable ease of movement between points of interest and in some instances fail to disclose a means by which to place points of interest on maps. Moreover, they impose time delays as maps are redrawn in response to each user input.

Other systems incorporate a moving map display that tracks vehicle progress down a March 5, 2002, discloses an in-vehicle computer architecture that executes a vehicle-environment modeling program based on inputs from environmental sensors, hardware sensors, and a map database. U.S. Patent No. 6,035,253, issued to Hayashi, et al. on March 7, 2000, a navigation apparatus for a vehicle that plots the present position of the vehicle on a map centered on the present vehicle location. U.S. Patent No. 6,445,397 issued to Boyer on September 3, 2002, discloses an apparatus for guiding a vehicle improved map scale control. Although these inventions incorporate dynamic displays, they do not enable a user to 'virtually' drive prospective routes. They are in effect limited to the area in the immediate vicinity of the vehicle.

It is an object of the present invention to enable users to 'virtually' drive prospective routes because this will enable them to dynamically find the location of an imperfectly remembered establishment or to verify the suitability of the proposed routing.

It is another object of the present invention to enable users to easily find points of interest and events of interest.

It is another object of the present invention to provide users with realistic view of the geographical information using dynamic graphics to represent three-dimensional structures.

It is another object of the present invention to provide an intuitive, user-friendly interface that minimizes text based input requirements.

It is another object of the present invention to organize access to World Wide Web information on public and commercial buildings by their true life geographic location.

Summary of the Invention

The current invention provides a system and method of using a map-based computer navigation system to perform geosearches. It provides access to information in a geopraphic database through an interface designed to simulate the view through a car's front windshield. The use of dynamic graphics ('movies') to represent landmarks and buildings that would b seen while traveling along a user determined route enables users to 'virtually drive' prospective routes and thus find the location of an imperfectly remembered establishment or verify the suitability of the proposed routing.

In the preferred embodiment, the interface control are modeled on an automobile steering wheel and stick shift to enable intuitive user-friendly use. The user controls the direction of a search using the 'steering wheel' and the scale at which information is presented using the 'stick shift'. An instrument panel on the dashboard allows the user to see total miles progressed as well as being able to view the length of various sub-routes.

By dynamically accessing desired information ,. The present invention will reduce users' expenditure of time and energy and consequently allow users to get information on more points of interest for a given level of effort. Moreover, by minimizing keyboard input requirements, the present invention will help reduce the possibility of repetitive motion injuries such as carpal tunnel syndrome.

Brief Description of the Drawings

Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiment with reference to the accompanying drawings, of which:

Fig. 1 Label of 'Local Search' with text box for entry of text search

Fig. 2 Graphic of States and individual counties with navigational device that shows steering device with 'stick shift' in 'fifth gear' to change gears and allow further depth

Fig. 3 Graphic of specific county with steering wheel and stick shifter in 4^{th} gear

Fig. 4 Graphic of specific city with steering wheel and stick shifter in 3rd gear

Fig. 5 Graphic of specific county with steering wheel and stick shifter in 2nd gear

Fig. 6 Graphic of virtual tour with text stating "paused" indicating user has pressed spacebar to halt virtual tour for more information with steering wheel and stick shifter in 1st gear

Fig. 7 Block Diagram showing flow of files loading and unloading.

Detailed description of the invention

As discussed above, the present invention, disclosed herein, is a system and method for using a map-based computer navigation system to perform geosearches. The current embodiment is described below as an example but those skilled in the are will recognize modifications can be made without departing from the present invention.

In the preferred embodiment, the system has two entry points, a user can use a text box to perform a customary search of database. Figure 1 shows an area where user will enter desired text and this position has label along side it stating 'Local Search". The results of this type of search will come in the customary form of text indicating a hyperlink. The hyperlink could be that of a store or a government office or local school. Clicking on a specific link this way will prompt the navigational devise to load in second

gear where store, government office or local school is located. The result is a map of the overhead or birds eye view of intersection or business area of desired entity. This map shown through the windshield of navigational device will indicate the address and an outline of desired entity but also any thoroughfares that are adjacent and the number of street lanes in front of entity. The navigational device is equipped with a steering wheel and stick shift as shown in Figure 2. The user is able to use the steering wheel to drive around area of initial interest to obtain further information. The database will recognize the present position of gear and map of entity and any further text searches at this point will only include that part of the database that is local in relation to initial entity. A more global search can be obtained by moving back to fifth gear and repeating above instructions.

A second way of doing a search is to begin driving as shown in Figure 2 where individual states can be brought up by using steering wheel to scroll them through the windshield. The graphic of each state is further divided into graphics that represent their counties. Each state scrolls by one at a time until user has selected desired state. By using the steering wheel the user can control a graphic of an automobile superimposed on the state graphics to indicate the county of choice. When desired county is found the user would shift the stick shift to fourth gear. Alternatively user can click on text of county and stick shift will automatically shift to fourth gear.

At the county level, Figure 3, individual cities will be placed according to their longitude and latitude. A text label will indicate their position and user can click on this label and navigational device will shift to 3rd gear shown in Figure 4. Alternatively user can click on gear plate which is labeled according to specific gear, by clicking on the

number 3 the gear shifter will move to that position showing the surrounding city. User can also click and hold on shiftier and slide in the same way one would shift an automobiles' gears to its desired position.

In third gear any interstate that may be present will be label as such and have squares used as labels to indicate entrances or exits from highway. By clicking on one of these squares the shifter will automatically move to 1st gear, Figure 6, and user will see a three dimensional movie of that particular entrance or exit and the exact number of lanes at that point. By doing this user who is headed on vacation can stay in first gear and travel their desired trip while seeing exact replica of interstate and all businesses along the side of the interstate. At each exit user can turn steering wheel to leave interstate and continue down road to city of choice.

Once user has located the general area of interest in third gear they will change gears to second and see an overview of business district or campus of interest, Figure 5.
At any point other than first gear a 'search' box will be present on the dashboard of the navigational devise. This allows the user to do a text search of specific entity desired. By clicking on this search box text categories will replace maps in the navigational devices windshield. As user clicks on category of interest, sub categories may appear. Once user has found the place of business they desire they will click on that text which will load a map of second gear showing address and business name and any through fares in adjacent area.

By shifting into different gears, the user can access the neighborhood county, state or national road networks and continue to control the direction of progress using the steering wheel. A car icon superimposed on a road network will allow the user to direct the

progress of the car icon using the steering wheel. As the car progresses in the higher gears, information about landmarks, exits, and nearby stores is presented in a scrolling fashion in a secondary window.

For example, this invention could enable a user in Tampa to retrieve information on a store previously visited in Orlando even if the user did not remember the stores name or exact location. On initial system startup, the view from the users dashboard would reflect a local Tampa street. The user would shift into fourth gear and use the steering wheel to guide the resulting car icon along the state highway network to Orlando. The user would then downshift into second gear and use the steering wheel to guide the car icon along the county road network to the general neighborhood of the store. The user would then downshift to first gear and virtually drive around the neighborhood to find the store. The user would then steer to the store and beeping the horn to access additional information about the store. User is able to press on spacebar of keyboard in order to 'pause' virtual tour.

The graphics representing signs and buildings along the street scroll past as the user progresses down the street. Labels for residential buildings can include their addresses. Labels for commercial and public buildings would also include their names and other identifying information. Various visual schemees such as icons or color-coding can be implemented to facilitate identification of the type of building. As the 'movie' progresses down the street, the user can select a particular storefront or steer down another street at an intersection using the 'steering wheel'. Each business would have storefront represented in first gear, user would be able to utilize pointing devise to enter store. The user would then see the entire interior of business and be able to move pointing device to

elevator or marquise of business directory. In the preferred embodiment, the user controls the direction of progress by moving the 'steering wheel' Figure 2 using a computer mouse. However, but those skilled in the art will recognize that other cursor control devices and even other means controlling the direction of progress such as using arrow devices and even other means controlling the direction of progress such as using arrow keys on a computer keyboard can be implemented without departing form the present invention. By minizing keyboard input requirements, the present invention will help reduce the possibility of repetitive motion injuries such as carpal tunnel syndrome and will reduce users' expenditure of time and energy in accessing desired information.

By dynamically accessing desired information, the present invention will reduce users expenditure of time and energy and consequently allows users to get information on more points of interest for a given level of effort. Moreover, by minimizing keyboard input requirements, the present invention will help reduce the possibility of repetitive motion injuries such as carpal tunnel syndrome.

As a user progresses through a given movie, movies that are likely to be accessed next are preloading. These include the movie for the next stretch of street along which the user is progressing as well as movies for approaching cross-streets and higher-level graphics that will be accessed if the user shifts gears. The once a political boundary has been passed system would load new political boundaries when is shifted to higher gear. This will further reduce the time required to access desired information. For a user looking for an imperfectly remembered address or various points of interest, these reductions in access time are cumulative.

After selecting an individual commercial or public building, the user will beep the horn to

access additional information about the building occupants. The extent of this additional information will vary but may include items such as contract information, panoramic 360-degree views of individual businesses, a building director, and links to the websites of business in the building,. Business will be able to devop their own business front on-line. In the preferred embodiment, the dashboard graphic shown in Figure 1 dissolves into a graphic of the building lobby with a building directory an an elevator access button after the user beeps the car horn 3. The elevator is used to access other floors. Once inside the elevator, the user will select the desired floor from options shown on the wall of the elevator. Those skilled in the art will recognize that other approaches such as links directly from the building directory can be used without departing grom the present invention.

In another example, a real estate agent could take prospective buyers on a virtual drive around prospective neighborhoods to see how far away police stations, fire stations, schools, grocer markes, and play grounds are from a listed house. This would be particularly useful for those buyers who have limited time to visit prospective homes and those looking form other states.

Figure 7 presents schematic of the systems methods of operation. Movies of individual streets are arranged st that reaching the end of one movie as the user progresses along a street or turns off onto a new street automatically selects and starts the appropriate next movie. Similarly, the system detects the location of the car icon when shifting gears and automatically selects and starts the appropriate next movie. In the

preferred embodiment, the system stores movies according to longitude or latitude/plats for easy reference and access. The interface accesses information in an associated database that includes information on pints of interest stored in a hierarchical organizational system.